Science and Engineering Advisory Council 2005 Report

The Science and Engineering Advisory Council (SEAC) spent much of 2005 dealing with change.

The council began the year serving then-Los Alamos National Laboratory (LANL) Director G. Peter Nanos, but closed out the year serving Director Robert W. Kuckuck.

During the first third of the year, Donald J. Rej was the leader of Science and Technology Base Programs (STB), SEAC's liaison division, but during the last eight months of the year, Terry Lowe was the STB director.

Howard Hanson, a staff member in STB-Laboratory Directed Research and Development (LDRD), was the STB-SEAC liaison for the first eight months of the year, but he left the Laboratory in September to take an academic position in Florida, and Lowe appointed Reynaldo Morales of STB-University Relations as the new liaison.

Throughout the year, the Laboratory was awaiting a decision on which of two bidders would become the new LANL operations contractor in 2006. The announcement had still not been made by the time of SEAC's last regular meeting on December 6. The lack of a contract decision affected the ability of technical staff members to plan for the future of their own careers, their projects, and the staffing of their projects.

In the course of the year, SEAC revised its outdated charter to reflect current practices and upgraded its website to make all summaries and reports available to all members.

But one thing remained constant: Throughout the year, SEAC reported directly to Chief Science Officer Tom Bowles.

Because of the impending change in contractor, the council—seeking greater stability during the coming transition—decided that the members who would normally leave the council on December 31, 2005, would instead stay on for another term. SEAC Chairman Michael Collins also agreed to serve for another year.

Following are brief accounts of the major topics addressed during SEAC's 19 meetings in 2005 and a list of the documents that the council produced (all of which are attached). Full summaries of all of the meetings were sent to all SEAC members, to the chief science officer and the deputy science officer, to Rej, to Lowe, to the STB-SEAC liaison, and to relevant speakers and administrators. Copies of the white paper on purchasing and the SEAC Charter were also sent to Kuckuck.

Meetings and Notable Events

February 1—SEAC greeted five new members and discussed what SEAC is: an independent voice advising the chief science officer and the Laboratory Director on issues affecting the morale and productivity of technical staff members. Hanson summarized Bowles' concerns: a notable increase in the number of retirements that could lead to a loss of critical knowledge and discourage outstanding postdoctoral researchers from coming to Los Alamos. SEAC began the creation of a list of member concerns that could be consulted in scheduling future discussions.

February 15—Two more new members were introduced. Hanson noted that he felt the list of concerns fell into two categories: "employee morale" and "doing science." A representative of Public Affairs, who was planning a story about advisory councils (which eventually appeared in the LANL NewsLetter), asked about SEAC's concerns for 2005. In that context, SEAC added to its February 1 list. (A combined list is attached.)

March 1—Hanson requested a discussion on SEAC's views of the categories used by LDRD to assess proposals for Exploratory Research financial support. (In FY03, he said, there were 10 categories; in FY04 and FY05, there were five categories with 17 subcategories. He provided lists.) A thorough discussion produced no call for more than five categories. Hanson subsequently summarized the points raised and shared them with the Science Council and LDRD leader David Watkins.

March 22—Sue Bargeloh of the Human Resources Division Office came to SEAC, seeking feedback on the LANL performance-appraisal process. The subsequent SEAC meeting summary listed two pages of points raised, but the first point summarized much of the discussion: "There are significant inconsistencies in how the requirements for Individual Performance Objectives and Overall Relative Contribution scores are applied." Bargeloh subsequently noted in her own summary of the meeting that there was a desire for uniform implementation of policy at the division level, but that there was also a desire for reasonable flexibility and for evaluations done at a level close enough to the employee to allow for genuine knowledge of his/her work. She said no one seemed to like the existing point system.

April 5—Hanson requested a discussion on alternate approaches to working hours. Once again, the summary of comments filled two pages. Two notable comments seemed to express the views of many: "I was hired under the 9/80 plan…." And alternative work hours are "a good recruiting and retention tool." At Junor's request, SEAC also discussed how members would like to see the Bowles communicate with technical staff members. The bottom line: "The essentials in good communication are that it must be two-way; it must be transparent; and it must be free of fear."

April 7— Hanson passed on to SEAC members (by e-mail) a note from Bowles welcoming individual SEAC comment on his own white paper on how small-scale science supports the Laboratory's mission. (SEAC had written a white paper on the same topic in 2004.)

May 3—Carole Rutten and Dave Foster of STB-Education Program Office gave a presentation on what was being done to revise and strengthen student and mentor training at LANL. Rutten said she would appreciate individual reviews and comments on her documents. She provided SEAC with the "Laser Accident Investigation Team Recommendations" and the "Implementation Policy and Procedure" on "Student Mentoring." SEAC's comments in the subsequent official summary filled three pages.

May 17—Warren Finch, acting group leader of Supply Chain Management (SUP)-9, spoke on "Overview of Procurement at LANL." His presentation and the resulting discussion eventually led to production of a SEAC white paper on purchasing (attached). At that same meeting, Lowe, the new leader of STB, visited SEAC to introduce himself.

June 21—The topic for this meeting was recruiting and retention at LANL. Carol Hogsett, Beth McCormick, and Sandra One Feather attended and participated in a lively discussion of issues and concerns.

July 19—Hanson provided an update on congressional discussion/action on LDRD funding. In addition, at Lowe's request, Hanson conducted a discussion on whether there should be a "career ladder" for scientists at LANL. At the close of the meeting, Hanson summarized the discussion by saying, "I'm hearing a lot of skepticism about changing the system," which now has only one title for scientists: "technical staff member."

August 2—Kuckuck, the new Laboratory Director, met with SEAC. He summarized his first two months at the Laboratory, noting his concerns that bureaucracy and rules were creating "an overhead burden that makes it very hard to compete," mentioning problems faced by foreign nationals, and discussing the long waits for clearance approvals. He said he was seeking out small, specific difficulties—"bite-sized" problems—that he could fix during his time in Los Alamos. SEAC members shared their concerns and views on many issues. Kuckuck told them, "I'm interested in anything you want to tell me."

August 2—Collins told SEAC that John Ahlquist of the University of California Office of the President had requested that representatives of SEAC meet with the university's Environment, Safety, and Health panel on August 8 to discuss "the SEAC view of environment, safety, and health initiatives and happenings at LANL." About five SEAC members subsequently attended. Collins said later that panel members asked many questions, and the discussion went well.

August 16—John Bretzke spoke on the "Operational Efficiency Project." SEAC members raised concerns ranging from the frequent changes in safety rules and regulations to what many saw as the growing difficulty in getting work done.

August 23—At the request of the SEAC chairman, writer-editor Charmian Schaller reviewed notes from several discussions and prepared a draft white paper on purchasing.

August 30—SEAC spent most of its meeting reviewing and revising the white paper. Hanson announced that he was leaving September 9.

September 13—SEAC completed revision of its two-page white paper on purchasing (attached). It was subsequently sent to SUP, to Bowles, to Lowe, and to Kuckuck. At the same meeting, Lowe met with SEAC again, noting that both he and Bowles would support the continuation of SEAC, which they view as a valuable group because its members are drawn from all of the scientific and technical divisions. Lowe suggested that a revised SEAC charter should discuss the issue of representation. He said, "SEAC should be part of the transition," and he said he himself would serve as the STB-SEAC liaison until a new liaison could be appointed.

October 19—Lowe announced the appointment of Morales, of STB-University Relations, as the STB-SEAC liaison.

October 25—Morales met with SEAC for the first time. SEAC discussed the scheduled December 1 announcement of the new Laboratory operations contractor and the potential impact of the change. SEAC also discussed the need for a new charter. Schaller took notes and subsequently distributed a "straw man" draft on October 31.

November 8—SEAC devoted most of its meeting to reviewing and revising the draft charter, making three significant additions: adding wording making it clear that SEAC members are not formally elected representatives and are not obligated to disseminate administrative statements and decisions, but do provide to the administration knowledge of TSM viewpoints; stating that the chairman/chairwoman may serve a third year as an *ex officio* SEAC member to assist in a

smooth transition; and requiring that SEAC must have present a quorum of at least half of the active members in good standing before it can ratify formal, final documents or recommendations.

November 22—Since there had been no statements of concern or opposition, SEAC ruled that the new SEAC Charter was in effect. SEAC agreed that because of the LANL transition, all current members who would normally leave the council on December 31, 2005, would, instead, stay on for another two-year term if they were willing to serve. Schaller circulated updated membership records to assist Morales in seeking new members to fill a few gaps. Collins agreed to stay on as chairman for another year and continue to attend Employee Advisory Council meetings. To lighten the load on Collins, Matthew Bement said he would attend the Science Council meetings, and Hong Cai agreed to attend Laboratory Information Meetings. The council discussed its role in the coming transition and decided to develop a list of positive qualities at LANL that SEAC would like to see preserved. Schaller took notes during the brainstorming session, and, on November 23, circulated the first draft of the list of positive points.

December 6—Bowles met with SEAC, updating the council on the latest information about the contract and providing an overview of the draft "Science Roadmap." He asked for SEAC comments on the developing document. SEAC subsequently decided that comments should be submitted individually because no further formal meetings were scheduled before the end of the year. SEAC discussed the draft document "Preserving Positive Qualities in a Time of Change," suggested many revisions, and asked for a second draft. That draft (attached) was circulating as the year ended.

December 20—SEAC held a holiday party after working hours.

December 31—When the year ended, SEAC had on its schedule a January 10 meeting at which it planned 1) to discuss the SEAC purchasing white paper with a representative from SUP, and 2) to review and revise the document on LANL's positive qualities. In addition, Kuckuck was scheduled to meet with SEAC again on January 24 to discuss the new contractor and SEAC's role in the transition.

Documents (all attached)

- A list of member concerns for use in scheduling SEAC speakers and discussions
- White Paper on Purchasing (with letter of transmission)
- Revised SEAC Charter
- "Preserving Positive Qualities in a Time of Change" (under review)

(Submitted by Charmian Schaller)

Attachments (4)

Possible topics for SEAC:

(From 2/1/05 meeting)

- The 2006 budget for weapons-related work is not expected to be very healthy. Are weapons really the future of the Laboratory? Should SEAC look at balance?

- Last year, SEAC developed a white paper on the importance of small science. With weapons funding shrinking, small science becomes even more important. Perhaps SEAC should revisit the question, "What is the climate for doing science in the Laboratory now?" Some people want more programmatic work and less science….

- There's a move afoot in Congress to cut LDRD funding from a maximum of 6% of the Laboratory budget to a maximum of about 5%. Such a change could have a significant impact….

- Last year, SEAC did a white paper on LDRD. Now the Science Council is looking at it too. The goal isn't a total revamping of the program now, but there is a push to work on "transparency" in the process so that people understand how funding is awarded. It's also important to staff LDRD committees with well-qualified people who take their roles seriously.

- Work on national energy policy is "a place where the Lab has to go." This is a research area that could replace weapons.

- If the Laboratory wants to improve retention of workers, it should look into providing start-up funds for new researchers. Universities use this approach successfully.

- Employee morale is a major problem at the Laboratory. Some scientists could get more startup money and better equipment by going elsewhere, but they come to Los Alamos because they hope it will be a wonderful place to do very high quality technical work.

- Retirement is "the topic of the day, the week, the month." People feel that they are working hard but that their wheels are spinning. They feel that some people work to the point of burnout and then risk termination.

- The Laboratory needs to coordinate research activities so that it can "accomplish the things it's capable of" and regain its stature. The Laboratory must find ways to make the best use of scarce resources.

- Employees have lost confidence. They feel that "nothing can be done easily here anymore." It seems that "no one is willing to take any risks." "Everybody is too

scared." Employees are being required to take more and more safety training—including training that isn't even applicable to what they are doing.

- "We never see the Lab push back" against excessive regulation.

- "You can see why science is degrading here." Managers spend all their time on safety and security. Science doesn't have the importance it once had.

- "The Laboratory does not support user facilities." There isn't even money to buy good, new electron microscopes.

- "The very same problems exist with large-scale computing."

- The Laboratory is getting lots of questions from private industry. People ask, "'Are you working now?'"

- The Laboratory "is very poor in succession planning," and new rules say employees "can't come back" after they have retired. As a result, a very serious situation could develop if many people chose to retire at about the same time. One sometimes hears, "'The Department of Energy would really like to see about 2,000 of the older people out the door.'" But they are the ones with the knowledge….

- The Integrated Work Management/IMP processes are applied inconsistently. Should a report be one page or 30 pages? The process needs to be evenly, sensibly applied.

- The cost of doing business is too high.

- Too much of the equipment is far too old. In industry, they usually replace equipment every seven years. "The government doesn't depreciate stuff." A piece of equipment that cost $15,000 is still valued at that amount when it's 30 years old.

- "Low bids produce leaks." In other words, choosing the lowest bidder may not always produce the best building.

- Science staff members must become better advocates for what the Laboratory does. Laboratory staff members must get much more savvy about who they are and what they can do."

- Perhaps SEAC should do a position paper on what the Lab should look like in two to three years. Where does this Lab need to go in terms of serving society?

- "I have a hard time attracting graduate students or postdocs when I show them where they're going to work because it's usually a trailer … a dump … rodent-infested … no air conditioning."

- But they *will* come if the Laboratory does the best research….

- How is recruiting of graduate students and postdocs going to go when recent events cause staff members to view students as "a big risk?" Staff members ask if their programs are going to survive; if the rewards of bringing in students are as great as the risks. "You can't watch over students all the time." Things will happen. Will people get fired?

- "Safety of people is very important." The Laboratory must train adequately. Scientists shouldn't take shortcuts.

- "Increasing bureaucracy makes getting anything done like wading through glue."

- "The Science Council will be looking at all new rules and regulations to see how they affect science.

- The Laboratory is only functioning because people "work the system."

- Over-zealous interpretation of rules and regulations is a serious problem.

- There should be "no stealth taxes" at the Laboratory. The Laboratory needs "accurate reporting" of how much of our time is spent on work, on safety training, on all-hands meetings, etc.

- Managers have become "safety nannies." They have so much paperwork to do that they have no time for real work. All leaders must be trained in everything. There is no time for true program management. Management jobs have become so unattractive that no one wants them. This is a "time bomb."

(From 2/15/05 meeting)

- "morale and the contract";

- how to keep good scientists;

- the push from Department of Energy Headquarters to consolidate certain technical areas;

- the President's shrinking budget for science;

- the need for continuity—that is, the need for support for the existing program this year until funding can be restored;

- the increasing focus of Laboratory-Directed Research and Development funding on threat reduction;

- rumors that money might be sequestered in a sort of division-level LDRD;

- the need for volunteers who will serve an active role in SEAC, which some view as "a sort of reality check" on how things at LANL (including the new Behavior-Based Safety Training) are affecting scientists;

- the developing mood of desperation among managers;

- efforts to do a "business model" for science;

- the tendency of things like the Enterprise Project and safety training to swallow up time and money that could, otherwise, be spent on science;

- business systems that are "broken";

- the credibility of management;

- repetitive and constantly changing rules, procedures, and training in safety and security;

- anxiety about the rules for supervising students—that is, worries that might lead scientists to avoid mentoring a new generation;

- the offensiveness of turning supervisors into "ergonomic nannies" who treat employees "like children"; and

- The tendency for over-regulated employees to worry about the rules surrounding ergonomics "while missing the Fat Phoebe you're kicking under the table."

White Paper on Purchasing
from the Science and Engineering Advisory Council
November 2005

(*These recommendations are intended to apply to *any* present or future purchasing organization at Los Alamos National Laboratory.)

Timely, accurate purchasing of goods and services is essential to the science and engineering mission at Los Alamos National Laboratory (LANL). The Laboratory spends $1 billion per year on more than 25,000 procurement transactions. Scientists and engineers, however, regularly experience frustration, long delays, and improper selection in purchasing that make their jobs unnecessarily difficult.

On May 17, 2005, the Science and Engineering Advisory Council (SEAC) held a meeting at which members shared information with Warren Finch, group leader of SUP-9. Discussion at a subsequent meeting led to a decision to prepare a white paper on recommendations that might improve procurement. SEAC's ideas are listed below.

- SEAC applauds the decisions to set up good processes and encourage more extensive use of purchase cards to buy small items. However, it should be noted that recent experience has made many people hesitant to use these cards. Some have even turned them in because of excessive audits, errors, and concerns about retribution for small mistakes. It will take time and repetition of the message to persuade people to use them regularly, but more extensive use of the cards will take pressure off the Supply Chain Management Division (SUP). To further reduce the burden on SUP, the Laboratory should consider reinstating local vendor agreements and eliminating Just-in-Time.

- The Laboratory should develop an expedited system for routine purchases of chemicals and other controlled items.

- Good communication is essential to the relationship between those who order and those who handle procurement. The Laboratory should have a clear, clean procurement website that is well maintained and includes telephone numbers and e-mail addresses of people who can provide scientists and engineers with prompt help when necessary. When a purchasing employee adds a client, he should immediately send that client an e-mail that includes current telephone and e-mail contact information and the appropriate blank forms. Clients should also be able to click a box on the purchasing website and get forms themselves, and a purchasing information hotline would be a good idea.

- More extensive automation of selection and ordering would be useful—but it is essential that the automation be reliable, efficient, and easy to use. End users should be involved in all discussions of new software, and such software should undergo field-testing by scientists and engineers who often need to order supplies.

- SEAC would like the Laboratory to strive for an order-completion time of one to two weeks at the most. SEAC understands that LANL is pursuing more streamlined purchasing processes but that both the National Nuclear Security Administration and the University of California (UC) must approve them. SEAC applauds the effort.

- LANL should see to it that an adequate number of people with solid education in purchasing are hired, properly trained, and retained at the Laboratory. To improve purchasing performance, the Laboratory might need to increase salaries and require more education when choosing new purchasing employees.

- SUP has been pursuing a policy of centralization because of its need to hire and train many new people. However, from the point of view of the scientist in the field, there is convenience in distribution of purchasing experts. Experts stationed with clients in the field are more likely to understand their clients' needs and have a sense of "shared fate." A balance between centralization and decentralization should be struck, and purchasing policy should be consistent Lab-wide. The personnel structure in the Chief Financial Officer Division (CFO) is a good example of this approach.

- SUP has a right to expect that requests submitted will be complete. Information should be available to assist scientists and engineers in proper purchasing practices. This information should be made available on line. It should stress the importance of filling out forms completely and accurately, the need for advance planning, and the difference between purchases and grants to universities (which SUP does not handle).

- Purchasers should be assigned promptly, and a single purchaser should handle an order from submission to satisfactory delivery. Purchase order numbers should be trackable and should make it clear where an order stands in the process and who should handle the current step.

- SUP should collect data about factors hindering procurement and then act promptly to eliminate the bottlenecks identified.

2005 SEAC Charter

Purpose

The Science and Engineering Council (SEAC) advises the Director and the Chief Science Officer (CSO), providing them with grass-roots information on issues that are affecting the productivity and morale of scientists and engineers across Los Alamos National Laboratory (LANL).

The council studies topics that it deems to be of major concern and provides written recommendations.

SEAC also researches and writes about specific issues when the Director or the CSO asks for the council's assistance on designated subjects.

Because the Laboratory's success depends on the excellence and effectiveness of its scientists and engineers, SEAC's role is vitally important to the LANL mission.

Responsibilities

SEAC's responsibilities are as follows:

SEAC maintains a dialogue with the Laboratory Director, the CSO, and appropriate LANL leaders and organizations to identify issues related to the science and engineering strengths of the Laboratory.

It advises senior management on the best approaches for assuring excellence in science and engineering and encouraging outstanding individual research, program development, and performance.

SEAC addresses issues and prepares written recommendations when such assistance is requested by the Laboratory Director or the CSO. It also initiates its own studies and the preparation of written recommendations when it identifies issues that are having a significant effect on the morale, excellence, and timely performance of work by Laboratory scientists and engineers.

It serves as a source of information for the manager of the Laboratory and for outside, expert organizations when its assistance is requested in determining the views, needs, and morale of LANL scientists and engineers.

The SEAC chairperson or a designee attends Laboratory Information Meetings (the LIM), the Science Council, the Employee Advisory Council (EAC), and other appropriate meetings to maintain awareness of key Laboratory activities, to share information, and to promote coordinated efforts for maximum efficiency in the research and performance of scientists and engineers.

At the close of each calendar year, SEAC provides to the Director, the CSO, and other appropriate leaders and organizations a brief, written summary of SEAC activities during the year. On request, the SEAC chairperson also provides an oral discussion of the year's achievements.

Membership

SEAC seeks members from every technical division at LANL. SEAC is uniquely valuable because its members are drawn from so many technical divisions that it can provide a sense of what scientists and engineers throughout the Laboratory think and feel about major issues. SEAC members are not formally elected representatives and are not obligated to serve as a conduit for conveying administrative statements and decisions; however, SEAC members do provide to the Laboratory administration knowledge of technical-staff-member sentiment.

All regular SEAC members must be nonmanagerial technical staff members.

The leader of the Science and Technology Base Programs Division (STB) or the STB liaison selects regular SEAC members and chooses the SEAC chairperson, inviting nominations from the leaders of all technical divisions and taking into consideration all recommendations received. The CSO provides final approval of those chosen.

Regular SEAC members serve staggered two-year terms. The chairperson may serve as an *ex officio* member for a third year to facilitate an effective transition.

EAC designates one of its members to serve as an *ex officio* member of SEAC, and SEAC designates one of its members (usually the chairperson) to serve as an *ex officio* SEAC representative on EAC. These representatives serve until they are replaced.

For SEAC to draw effectively on the widest possible opinion base, each member should attend meetings regularly. Members who must miss a meeting are expected to provide advance notification to the chairperson and to consider sending a substitute. If a member misses three consecutive meetings without providing advance notice or an acceptable explanation, SEAC shall assume that the member has resigned and shall ask the STB liaison to seek a replacement.

Administration

SEAC is chartered by the Laboratory Director and reports to the Director through the CSO. Both the Director and the CSO are invited to attend SEAC meetings several times a year.

SEAC normally holds meetings every two weeks, but more frequent meetings may be held when necessary. SEAC must have a quorum of at least half of the active members in good standing to ratify formal, final documents or recommendations. At routine meetings, the chairperson decides when enough members are present to begin work.

STB provides administrative support for SEAC activities. STB provides a liaison to SEAC who attends meetings, recommends members and a chairperson to the STB leader and the CSO, and assists in identifying important issues, arranging programs, reserving rooms, and other activities as requested.

CSO provides a writer-editor who attends meetings, writes full summaries of the discussions at meetings, disseminates these summaries to all SEAC members and to the Laboratory leadership as appropriate, drafts documents as requested, drafts the annual report, maintains the SEAC website (posting all summaries, annual reports, and final documents), and assists in coordination as requested.

Preserving Positive Qualities in a Time of Change

The Science and Engineering Advisory Council (SEAC) is a group of nonmanagerial employees created to advise the Laboratory Director on issues affecting the morale and productivity of scientists and engineers at Los Alamos National Laboratory (LANL).

Because SEAC has members from nearly all of the Laboratory's technical divisions, it is uniquely valuable in serving as a forum on grass-roots opinion.

Created by former Laboratory Director Sig Hecker, SEAC has routinely provided Laboratory management (and four Directors) with white papers on critical topics affecting the ability to do science at LANL. Among the council's recent documents are "What Should Be Included in the Laboratory Management Contract Request for Proposals," "The 'Care and Feeding' of Small-Scale Science at the Laboratory," and the 2005 "White Paper on Purchasing."

SEAC wants to play a positive role in the 2006 transition to a new management contract and would be glad to serve the incoming Director.

In November and December 2005, SEAC members discussed at length the qualities that have encouraged good science at LANL throughout its history. Good science is essential to serving our national security needs. These qualities made it possible for Laboratory scientists to speed the conclusion of World War II and preserve the peace in the challenging years that followed.

They include: maintenance of a Laboratory that is diverse; has multiple purposes; allows for mixed programmatic and individual research; gives all scientists the same rank—"staff scientist"; and allows scientists a degree of intellectual ownership of their work as exemplified in publications, patents, and outside presentations.

Listed below are specific practices—prioritized by the SEAC members—that exemplify these qualities.

1) An environment in which employees can work on varied, multiple projects—for example, in weapons and in basic research—drawing satisfaction from improving national security while increasing our knowledge of the world. Such an environment draws bright scientists to the Laboratory and creates new knowledge that benefits work addressing all of the nation's needs.

2) An environment of mutual respect in which wide diversity in background and scientific training makes it possible within minutes to find new ideas as well as established expertise on almost any subject. SEAC strongly endorses the retention and continued hiring of foreign nationals. To serve this nation best, the Laboratory must draw the brightest from all countries—and screen all candidates carefully.

3) A postdoctoral program that provides a chance for young scientists to learn about opportunities at the Laboratory and for Laboratory leaders to choose from the best and brightest. Such a program builds an outstanding staff that can produce world-class work to meet any need.

4) An environment in which nonmanagerial technical staff members are valuable to the institution and have a voice in decision-making. Decision-making that involves employees at every level makes for a strong, unified institution.

5) A setting in which, with the proper approvals, individuals can attend Laboratory talks on a wide variety of useful and interesting topics, pursue a variety of science programs and funding sources, and transfer easily from one division to another to learn new skills and apply their abilities in new ways. The strongest science often comes from the most surprising places.

6) Staff development programs that help current employees keep their skills up-to-date and assist in the recruitment of outstanding new people. Having found the best and the brightest, the Laboratory should take steps to preserve and strengthen their talents.

7) An environment that encourages scientists to publish and provides financial incentives for innovation. A scientist will produce more when he sees in his work not only a way to help the nation and his employer, but also a way to help himself.

8) A Laboratory-Directed Research and Development (LDRD) program—or something similar—that funds the exploration of new and exciting research. Such research attracts talented scientists in cutting-edge fields and keeps the Laboratory at the forefront of basic research.